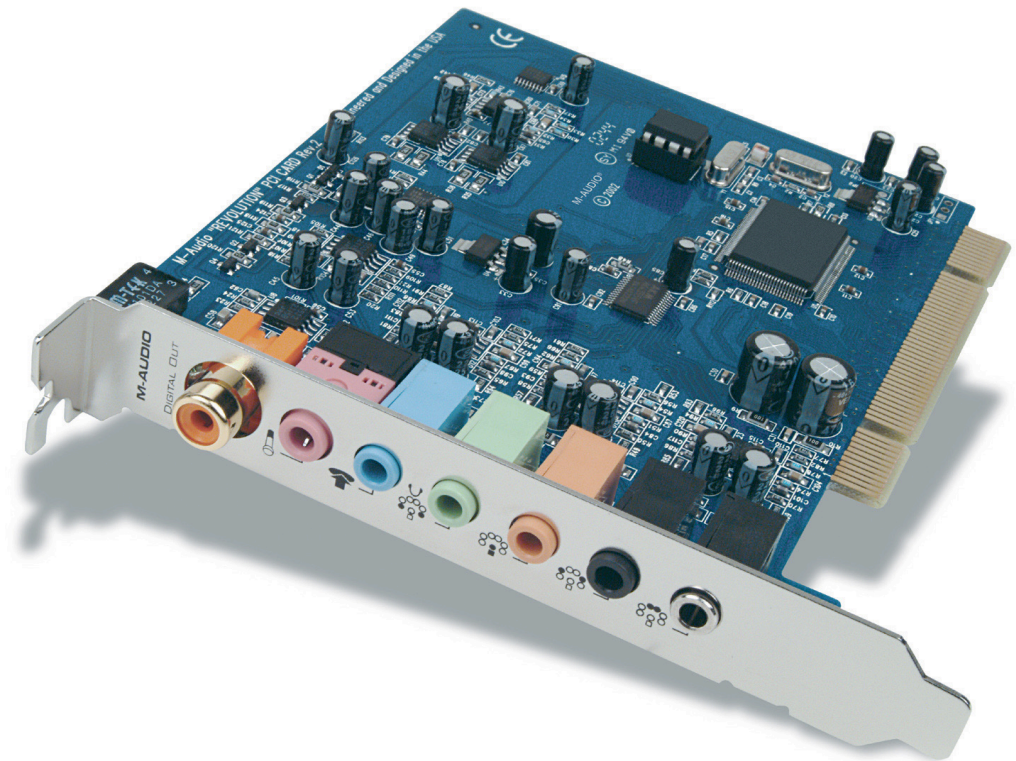


M-AUDIO®

Revolution 7.1 Surround Sound Audio Card



Reviewer's Guide

REVIEWER'S GUIDE

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The information contained in this document was examined carefully and is believed to be accurate as of its date of publication.

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A Note To Product Reviewers

We're pleased that you have chosen to review M-Audio's Revolution 7.1 high-definition surround-sound audio card. It's a product we are very excited about. This guide provides you with editorial background information to assist you in writing your review. It is not, however, a replacement for the user guide; you should use the two together. We hope you'll find this reviewer's guide useful. We'd like your feedback on this document and look forward to reading your published review.

Additional resources are available to assist you with your review. A list of telephone contacts is provided on the next page. Don't hesitate to call when any question—big or small—arises. If this guide accomplishes one goal, it is that we want to make sure you publish a factually accurate review, regardless of your opinion of the product itself. Also, be sure to read the printed documentation that is included with the product you received. Finally, the M-Audio Web site, located at www.m-audio.com provides up-to-the-minute information.

About our company name: Midiman Inc. is changing its legal name to M-Audio Inc. In your review, please refer to "M-Audio," not Midiman.

Product photos: You can download high-resolution photographs of the Revolution 7.1 audio card from www.m-audio.com/company/images.php.

Key Editorial Contacts

As you conduct your review, we encourage you to call with questions. Though we've worked hard to ensure that you have all the facts needed to write an accurate and comprehensive review, occasionally a question may arise that isn't covered in this guide. For publication purposes, refer your readers to the M-Audio Web site, www.m-audio.com.

NOT for publication; For use by editors only

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Background Information

Today's Audio Cards: Pro Sound at Low Prices

Two-channel stereo just doesn't cut it anymore as users demand high-quality surround sound for their DVD enabled computers

COMPUTER audio has come a long way. Just a few years ago, PC and Mac users settled for a pair of tinny, low-fidelity, battery-powered speakers driven by a mediocre sound card that generated a lot of background noise. How that has changed! As savvy consumers have become accustomed to low-cost, high-performance, easy-to-use surround-sound DVD home theater systems, they are placing similar demands on computer audio—just as they did with computer video. The Revolution 7.1 answers these demands by delivering professional-quality, high-definition audio signals to as many as eight speakers.

As video technology advanced, sound lagged. Now, major vendors are continually introducing new technologies that support multi-channel surround sound and promote media as a key purpose for the computer:

- Apple Computer: “Digital Hub”
- Intel: “The center of your digital world”
- Microsoft: Windows Media Center Edition

In addition, “power gaming” demands the ultimate in both video and audio. Most movies are now released to DVD with at least six audio channels (Dolby Digital 5.1), and, in some cases, with DTS ES 6.1, or Dolby Digital EX 6.1 (which Dolby and THX recommend playing on a 7.1 system). Two new music formats, SACD (Super Audio CD) and DVD-audio are likely to become increasingly important. Yesterday's audio cards simply can't keep up; they're mired in hopelessly obsolete 1990s technology.

**M-AUDIO'S
MISSION IS
TO BRING
PRO-QUALITY
AUDIO PER-
FORMANCE TO
THE MASS
MARKET IN
EASY-TO-USE,
AFFORDABLE
PRODUCTS**

Top 5 Cool Things To Do With The Revolution 7.1

The Revolution 7.1 offers phenomenal high-definition sound and provides to up eight channels of professional-quality audio—all for less than \$100. But so what? It's what your readers can do with the product that matters. Here are some examples you can share with your publication's audience.

Games: You've never heard games sound like this before! Surround your PC with up to seven speakers and a subwoofer for a totally awesome gaming experience. Games enabled with Sensaura simply sound amazing. And M-Audio hasn't forgotten about the thousands of games encoded with two-channel stereo. They'll sound better than ever, thanks to Revolution 7.1's Circle Surround II technology.

Virtual DVD hardware player: Turn any DVD-equipped Mac or PC into an awesome-sounding hardware DVD player.

Digital recording: Convert those old vinyl record albums to professional-quality high-definition digital audio. With The Revolution 7.1 and a user's favorite digital recording software, those precious old albums can be preserved in glorious 24-bit/96kHz fidelity.

Home theater: The Revolution 7.1's higher 24-bit/192kHz fidelity and 107 dB dynamic range greatly improve the listening experience of computer-based playback of CDs, MP3s and Internet radio. The Revolution 7.1 elevates computer-based audio to the level where the computer can play a viable roll as an audio source in a sophisticated home entertainment system. Internet radio, for example, can be realized in sufficiently high fidelity to warrant connecting the computer to the home entertainment system. And with new high-definition TV tuner cards and high-quality DVD playback, the PC is more capable than ever of replacing a stack of home theater components. The best quality surround sound is key.

Presentations: Make business presentations memorable by enveloping an audience with seven channels of high-definition surround sound and a seat-rattling subwoofer. PowerPoint never had it so good.

WITH UP TO
SEVEN CHAN-
NELS OF SUR-
ROUND SOUND
AND A SUB-
WOOFER,
GAMES AND
PRESENTA-
TIONS HAVE
NEVER HAD IT
SO GOOD.

Key Editorial Statement

We know of no other audio card that offers support for 7.1 surround, a coaxial digital connection with AC3 and DTS support, high-definition 24-bit/192kHz audio fidelity, and virtual surround sound from only two speakers—let alone at a street price of about \$99.99.



Product Details

About The Revolution 7.1

With this card, gamers, media enthusiasts, and business users can add speakers and supercharge their systems with eight channels of pro-quality audio

THE Revolution 7.1 is half the size of the stereo sound cards of just a few years ago, yet it delivers up to eight separate channels of sound, is far quieter, and is priced less than \$100. It includes full (not trial) versions of Tony Hawk's Pro Skater 3, WinDVD4 Dolby Digital EX Edition, VJ Lite, and trial versions of other software.



Time to Upgrade:

Stuck with poor sound for years, many computer users don't know they can upgrade their sound card and speakers to get professional, high-quality audio. Now is the time.

Key Revolution 7.1 Features

Surround Sound	Up to eight separate channels—left, center, right, surround (2), and surround center/rear (2) plus subwoofer—completely envelope users.
Surround effect from two speakers	SRS TruSurround XT technology gives surround-sound effect from a traditional stereo two-speaker set-up or headphones.
Convert stereo into true surround sound	Advanced Circle Surround II technology creates true multichannel surround sound from stereo MP3s, CDs, and other audio.
Ready for most encoded formats	Supports Dolby Digital 5.1 (AC3), Dolby Pro Logic, DTS, and other encoded multi-channel formats.
Best signal-to-noise ratio available*	Even the 106dB SNR of Creative's Sound Blaster Audigy 2 Platinum eX can't match The Revolution 7.1's SNR of 107dB.

* source: www.soundblaster.com/products/audigy2_platinum_ex/specs.asp

**WE'VE TAKEN
M-AUDIO'S
EXPERTISE IN
DEVELOPING
PROFESSIONAL
SOUND CARDS
AND BROUGHT
IT INTO THE
CONSUMER
MARKET.**

What Makes It So Good?

Glad you asked—and we're sure your readers will want to know, too. Here are the two key factors in achieving superior sonic performance in the Revolution 7.1.

First, we're using cutting-edge components, including the Envy 24HT chip from Via Technologies and components from AKM Semiconductor. These have only recently become available and they allow us to generate such high audio quality.

Second is the critical issue—and some may say art form—of circuit board design. The board layout and design were done in such a way as to keep the audio signals as clean as possible. This is more difficult than it would seem. Laying the wrong trace over the wrong area, or placing it too close to an electronic component can introduce noise into the signal, degrading sound quality. For over a decade, M-Audio has developed professional audio cards used commercially to master albums and to do other high-quality audio work, including playback. We've taken our expertise in the professional audio market and brought it to the consumer market.

Isn't a Computer's Internal Sound Capability Enough?

Even though an audio card can reproduce signals across the entire frequency spectrum (20Hz to 20kHz), that doesn't mean it does so with smooth, linear response. Dynamic range and noise may be sub-par, too. The Revolution 7.1 features excellent linear frequency response, delivers superior dynamic range, and virtually eliminates noise.

But Aren't CDs and MP3s Recorded In Two-Channel Stereo?

They sure are. And we've taken care of that. After investing in a Revolution 7.1 audio card, seven powered speakers, and a powered subwoofer, users will undoubtedly remember that their CD and MP3 music collections were recorded mostly in traditional two-channel stereo. Circle Surround II from SRS solves this shortcoming, using advanced algorithms to transform two-channel stereo (or even mono) source material into real multichannel audio for playback through a full complement of surround speakers. This is the same technology that many high-end home-theater receivers use.

What If A User Doesn't Have A 7.1 Speaker Set?

Revolution 7.1 works great in surround modes other than 7.1. It fully supports 4.0, 4.1, 5.0, 5.1, and 6.1 as well as 7.1 surround, so you can use almost any surround speaker set. And users who have only two speakers or headphones can still enjoy the effect of surround sound. TruSurround XT places virtual individual surround channels where they should be, as though a full complement of speakers had been installed. This capability transforms 5.1 or 6.1 multichannel sources, such as Dolby Digital or Pro Logic encoded DVDs or movies into virtual surround from a pair of stereo speakers or headphones. It can even enhance non-surround material such as music and some games.

Outclasses Audigy 2 At A Lower Price

For a little less money than Creative's new Audigy 2 sound card, the M-Audio Revolution 7.1 offers more audio channels, higher fidelity, lower distortion, and twice the platform support. The following chart compares major specifications of the Revolution 7.1 with the Creative Audigy 2 and the Hercules Gamesurround Fortissimo III. In every category, the Revolution 7.1 is superior.

WITH ITS 107DB SNR, 7.1 SURROUND, AND GAMING SUPPORT, THE REVOLUTION 7.1 IS THE ULTIMATE CONSUMER AUDIO CARD.

Competitive Matrix				
Revolution vs. Audigy 2, Gamesurround				
		M-Audio Revolution 7.1	Creative Audigy 2	Hercules Gamesurround Fortissimo III
Price				
	MSRP	\$119.99	\$129.99	\$49.99
	*Street	\$99.99	\$119.99	\$49.99
Audio Fidelity				
	Stereo	24-bit/192kHz	24-bit/192kHz	18-bit/48kHz
	7.1	24-bit/192kHz	24-bit/96kHz (5.1 only)	18-bit/48kHz
ASIO support				
	Playback	24-bit/192kHz	16-bit/48kHz	Unsupported?
	Record	24-bit/96kHz	16-bit/48kHz	Unsupported?
Platforms Supported				
		Macintosh, PC	PC only	PC only
Audio Quality				
	SNR	107dB Stereo to 7.1	106dB on L/R/SL/SR 90dB on C/Sub/Rear C	90dB Stereo
	THD+N	.003%	.004%	.017%
Sources: M-Audio company data, specifications from www.soundblaster.com/products/audigy2/			*street price available at a major retailer, such as CompUSA	

Understanding the 24-bit/192kHz Capability

Digital audio quality depends on bit depth and sample rate. Bit depth refers to how many bits of information are available to represent each sample, a factor that translates to dynamic range. Sample rate is how many times per second the sound is sampled. The standard for today's audio CDs is a sampling rate of 44.1kHz at a resolution of 16-bits per sample. The Revolution 7.1 supports sampling rates up to 192kHz and resolutions up to 24-bits—the highest available in both the professional consumer markets.

Product Info Box

Revolution 7.1 Product Summary	
In Brief	The Revolution 7.1 is the ultimate consumer audio card for PC or Mac. It's perfect for power gamers who want to supercharge their audio the way they've already cranked up the video. DVD enthusiasts can use their computer as the centerpiece of a high-quality home-theater. Music buffs can revitalize their existing CD and MP3 collections or enjoy new surround music. And business users will get wows from their presentations.
Operating systems supported	Windows Me, 2000, XP; Mac OS 9.2.2 or later, Mac OS X 10.1.5 or later
Price MSRP/Street*	\$119.99 / \$99.99
Warranty	1-year limited
Included Software	Full version of Tony Hawk's Pro Skater 3 (PC only), WinDVD 4: Dolby Digital EX 7.1 Version (PC only), VJ Lite, VLC Dolby-Digital Enabled DVD player for Mac; 100 ProSessions sounds and loops, free M-Powered Artists Enhanced CD
In the box	Audio card, driver CD, applications software CDs, M-Powered Artists Enhanced CD, User guide, Registration card
Vendor	M-Audio Arcadia, Calif.
Web site	www.m-audio.com

*Estimated. Actual prices may vary.

Testing The Revolution 7.1

There's only one way to check out the features of any audio card, and that's to install it, load a CD, and listen to the music.

“Oh, baby, let the music play”

—The Doobie Brothers

THE REVOLUTION 7.1 IS A GREAT CHOICE FOR GAMERS AND DVD OR MUSIC ENTHUSIASTS, WHETHER THEY HAVE EIGHT SPEAKERS OR JUST TWO.

WHEN you work with the Revolution 7.1, it's important to remember that you'll be examining two separate products—the hardware and the driver software—that work together as one. Several applications ship with the sound card; they are beyond the scope of this reviewer's guide.

In this portion of the Revolution 7.1 Reviewer's Guide, we'll cover the following:

- Test bed considerations
- Hardware set-up
- Software installation
- Listening tests

The Test Bed

The best test of a sound card is to listen to it—just the way a gamer, or music or DVD enthusiast would use it. You'll need the following equipment for testing your Revolution 7.1:

Computer

You can use a Macintosh or a PC as long as it has a free PCI slot and meets the minimum system requirements. For a PC, Windows Me, 2000, or XP are required. For a Macintosh, Mac OS 9.2.2 or later is required (OS X 10.2.3 or later is recommended). **Speakers**

To best experience the Revolution 7.1's awesome sound you should have:

- Seven powered speakers (left, center, right, surround (2) and rear (or center) surrounds (2). Ideally, you'll use 6 matched speakers, plus a center speaker designed to work with the others. You can use passive speakers with a high-quality multi-channel surround receiver for even better quality playback.
- Powered subwoofer

ACCORDING
TO DOLBY AND
THX, DOLBY
DIGITAL EX
DVDS ARE DE-
SIGNATED TO BE
PLAYED BACK
ON A 7.1 SUR-
ROUND SYS-
TEM.

The Revolution 7.1 works well with almost any receiver or powered speaker set. It fully supports stereo, headphones, stereo with subwoofer, 2.1 (with discrete subwoofer), quadraphonic, 4.1, 5.1, 6.1, and 7.1 configurations. Though 7.1 multimedia speakers sets for the consumer market are just appearing, 7.1 is firmly entrenched in the home theater receiver market. See additional information about speakers in the next section, and refer to the "7.1 Surround Sound Receivers" section for a list of some of the many 7.1 receivers currently available.

Content

You can use your favorite game, movie, DVD, MP3, WMA or other audio file, or just about anything else. However, the appendix lists sample scenes and songs that make great test content for certain applications. We recommend you use the recommended content unless you have known content that you are comfortable with. Not all movies, for example, are mixed with use of surround channels, which can skew a surround listening test.

About Consumer Multimedia Speakers

Revolution's audio quality exceeds that of any consumer multimedia speaker system. Consequently, you should use the best speakers and amplifiers available for your evaluation.

- If you do not have access to a quality 7.1 home theater receiver and speakers, you can use any off-the-shelf multimedia system.
- If using a set of multimedia speakers, it is best to use a "higher end" set rather than an inexpensive set with poor sound quality. Klipsch, Logitech, Cambridge, Midiland, and Harman Kardon can be good sources for better quality multimedia speakers. Creative's Inspire 6.1 offers an additional surround speaker, but at under \$100, we believe the set sacrifices quality for price.

Speaker availability. As of March 2003, 7.1 multimedia speaker sets were not generally available. This is largely because 6.1/7.1 sound cards are only now reaching the retail market. Now that these sound cards are available, several speaker manufacturers have begun development of 7.1 multimedia speaker sets.

Since Revolution provides discrete 7.1 line outputs, some users may elect to "upgrade" their existing 5.1 multimedia speaker set by connecting a stereo set of powered speakers to the rear surround channel. Though this may not provide

the best sound quality or balance possible, it is an inexpensive and quick way to upgrade a consumer 5.1 speaker set to 7.1.

Hardware Set-Up

Simply install the Revolution 7.1 in an available PCI slot in a Macintosh or PC. Next, you'll connect the speakers. Finally, reboot the system and install the software drivers. Optionally, you can install the included software applications. For the DVD playback tests, you should install the included WinDVD 4 application (PC) or the Video Lan Client (Mac) which may be available in your Revolution retail box or can be downloaded from www.videolan.org.



Note the color coding and intuitive labeling of the card's seven jacks. Refer to the chart below to understand the color-coding system and which speaker channels or inputs each of the seven jacks represents.


WITH ITS INTUITIVE JACK LABELING AND COLOR CODING, THE REVOLUTION 7.1 IS A SNAP TO HOOK UP TO MULTIMEDIA SPEAKER SETS.

Connection Color Coding	
Digital Output (orange)	S/PDIF Coaxial output. To use, purchase an RCA or Coaxial Digital cable for connection to a digital recorder, mixer, or receiver.
Mic In (pink)	Connect a microphone for recording, videophone, or voice-recognition applications. Jack is a 3-conductor TRS-type for condenser (2-conductor) and electret (3-conductor) microphones.
Line In (blue)	Line-level input. Used to record into user's favorite audio-recording program.
Front L/R speakers or headphones (green)	Connects to powered Left and Right speakers, located to the left and right of computer monitor. For a two-speaker stereo setup, use this jack. Also used for stereo headphones.
Center/Subwoofer (orange)	Connects to powered Center and Subwoofer speakers. Locate the center speaker above or below monitor. The subwoofer, with its low, non-directional frequencies, can go almost anywhere.
Surround L/R (black)	Connects to powered Surround Left and Right speakers, located to left and right sides, just behind listener's head.
Surround Rear L/R (silver)	Connects to powered Surround Center (or "Surround Rear") Left and Right speakers, located directly behind listener.
Source: Revolution 7.1 user guide	

Speaker Output Jacks

You can see in the preceding photo that Revolution employs 1/8" stereo output jacks that can be connected to powered speakers or to the inputs on a surround-sound receiver. Each jack combines two speaker outputs, saving space and simplifying installation. (For example, the Center/Subwoofer output is actually the output for both the Center and Subwoofer channels.) Most multimedia speakers use 1/8" stereo input cables with the same color coding as used on Revolution 7.1. Simply match the colors to easily connect speakers.

If your speaker or receiver jacks are of the RCA type, instead, use a 1/8" to RCA cable (see following photo). This common cable can be purchased at most local stores, such as Radio Shack or Best Buy.




Use a 1/8" to RCA cable to connect with speakers or receivers outfitted with RCA jacks. The white connector (top) connects to the first listed channel, the red jack to the second. For example, with the orange Center/Subwoofer jack, the white jack goes to the Center speaker, the red to the Subwoofer.

Shown: Radio Shack Part #42-2550. Note: higher quality cables yield better sound quality.

Software Installation

The User Guide provides detailed information, including screen shots, about installing the software drivers on the various versions of the Windows and Mac OS operating systems. For your convenience, here are the appropriate User Guide page references:

Windows XP.....	Page 5
Windows 2000.....	7
Windows Me.....	9
Mac OS 9.....	10
Mac OS X.....	11



M-Audio continuously improves the quality and feature set of its driver software. We recommend that you download the latest Revolution 7.1 driver software for your operating system from:
www.m-audio.com/driversearch.php.
New features have been added, and existing ones enhanced.

Surround Sound Formats

From simple stereo to 8-channel surround, a variety of sound formats are found on DVDs. More detailed information can be found on pages 14–16 of the User's Guide. The standard speaker configurations, listed in the following chart, are used to play the most common audio formats. Note that not every encoded format has a separate encoded channel for each speaker. For example, a true 2.1 speaker configuration plays back a stereo source, but relies on bass management to route bass frequencies to the subwoofer, creating the third discrete audio channel. Similarly, the extra signal for the two surround speakers in a Pro Logic or 7.1 (Dolby Digital EX) format is actually encoded into other channels and subsequently broken out by a decoder.

Speaker Configurations

2.0	Left, right
"2.1"	Left, right with subwoofer (no discrete subwoofer input)
2.1	Left, right; discrete subwoofer
4.0	Left, right, two surrounds
4.1	Left, right, two surrounds; subwoofer
5.0	Left, right, center; two surrounds
5.1	Left, right, center; two surrounds, subwoofer
6.1	Left, right, center; three surrounds, subwoofer
7.1	Left, right, center; four surrounds, subwoofer

**REVOLUTION
SUPPORTS ALL
OF THE MOST
COMMON—AND
EVEN SOME OF
THE MORE OB-
SCURE—TYPES
OF SPEAKER
CONFIGURA-
TIONS.**

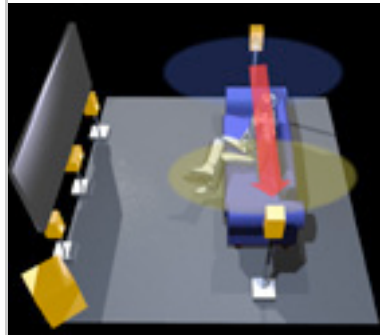
7.1 Surround Sound

Because 7.1 surround sound is new, some of your readers may be unfamiliar with it. To assist you in providing your readers with an authoritative overview, we've provided you with answers to the five most commonly asked questions about 7.1 surround. For more detailed information, visit the web sites of Dolby, DTS, THX, and Microsoft about their respective technologies.

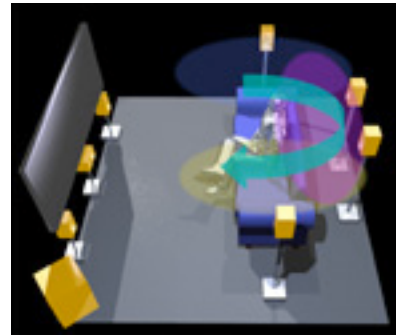
Q	"Why would I want more than 5.1 surround sound?"
A	Simply put, 7.1 provides a more immersive surround experience. Sound goes not only from the front to the side-positioned surround speakers, but also goes straight from front to rear, and from the sides, can loop around the listener in a half circle. The following graphic illustrates this idea. The 7.1 experience provides a level of realism that 5.1 cannot deliver. For those interested in the ultimate surround experience, 7.1 is the way to go. The best way to compare is to audition an EX title with a scene that has good surround mixing, such as the Star Wars Pod Racer scene. Compare the surround experience in 5.1 vs. 7.1

Q	"Where do the extra speakers go?"
A	The extra speakers go directly behind the listener(s) as shown in the following illustration.

Speaker Placement Guide



5.1 Surround Sound



7.1 Surround Sound

Q “What’s the difference between 6.1 and 7.1?”

A For today’s cinema content, it’s first important to note the distinction between the number of audio channels encoded in the content, and the speaker configuration on which that content is to be played.

Perhaps the easiest way to illustrate this with new technologies, such as Dolby Digital EX or DTS ES, is to first look back at the original Dolby Pro Logic format. Though Dolby Pro Logic contains only four decoded channels (Left, Right, Center, and Mono Surround), it is designed to be played back with two surround speakers, each playing the same mono surround information. The newer 7.1 is similar: Content is encoded/decoded as 6.1 information, but the Rear (or Center) surround channel is intended to be played on a 7.1 speaker configuration, rather than 6.1. Using two rear surround speakers provides better fill, more natural sound, better sound dispersion, and—with multiple listeners—a wider “sweet spot.”

For more information, read the Dolby Digital EX listener’s guide, located at www.dolby.com/ht/co br 0110 ListenersGuideEX.html.

The Revolution 7.1 can also output 7.1 discrete channels. This is great for today’s new surround formats, such as Windows Media Audio 9 Professional, that already support discrete 7.1 surround sound. It also makes the Revolution 7.1 ready for future formats that take advantage of 7.1 surround.

Q	“What content is available in 6.1 or 7.1?”
A	With Microsoft’s January 2003 launch of Windows Media Audio 9 Professional, both music and movie content will be available in 7.1 surround sound (in addition to 5.1). Circle Surround II generates a 7.1 content mix from any stereo source, Pro Logic, or Circle Surround-encoded material. Using the “Virtual 7.1” or “7.1 Expansion” feature in Revolution’s Control Panel, you can experience added surround fill when listening to any 5.1 content. Also, 6.1 content, including Dolby Digital EX, DTS ES, and DTS Discrete ES, are all designed for playback on a 7.1 setup.

Q	“Where can I get a 7.1 receiver or 7.1 speaker set?”
A	See “About Computer Multimedia Speakers,” above, and the “7.1 Surround Sound Receivers” section, located in the Appendix.

Revolution Control Panel

After installing the hardware and software, use the control panel to manage all aspects of the Revolution 7.1 audio experience. As you go through the suggested listening tests, detailed later in this section, you will choose many options from the control panel.

Launching the control panel varies by operating system:

Windows: Double click the “M” icon in the system tray

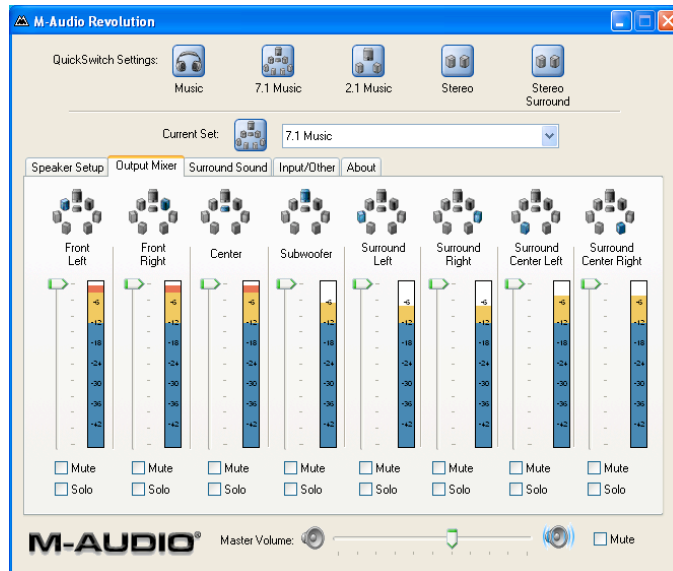
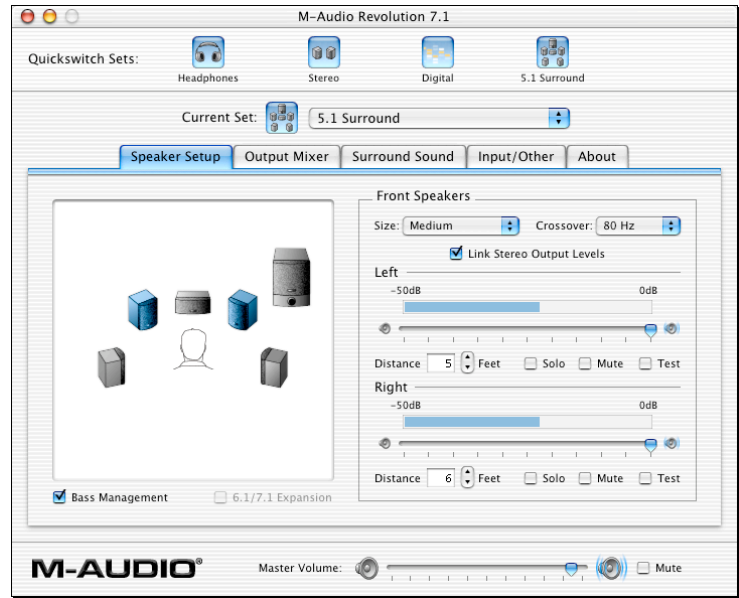
Mac OS9: Open the Control Panels folder and select “M-Audio Revolution”

Mac OS X: Double click “M-Audio Revolution” in the Applications folder

Launching the control panel displays the speaker set-up screen. Note the folder tabs that appear horizontally across the control panel. They provide access to the Revolution 7.1’s various audio-management features. Detailed information about all aspects of the control panel is located on pages 17–24 of the User Guide.

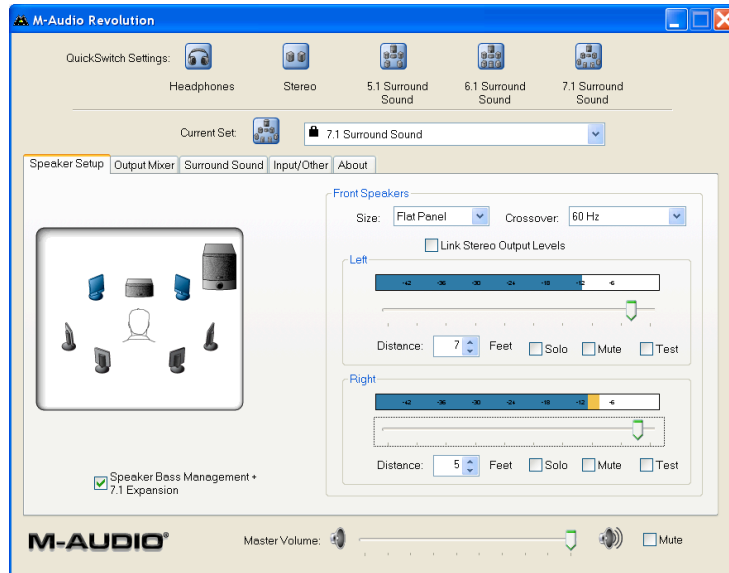
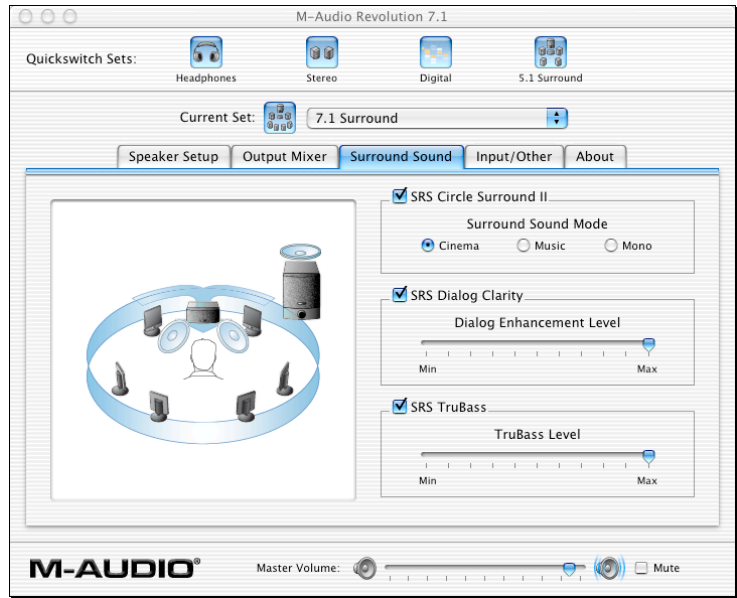
SETTING UP
TECHNICAL
SPEAKER OP-
TIONS CAN BE
AS EASY AS
CHOOSING
THEIR MODEL
NUMBER FROM
THE REVOLU-
TION CONTROL
PANEL'S POP-
UP LIST

Speaker Setup (Mac). Indicates number of installed speakers, their sizes, distances from the listener, crossover frequency, and more. Specifying more speakers than are connected may cause sound to be routed to non-existent speakers, resulting in audio information being unheard. The "Test" function ensures correct speaker connections and levels.



Output Mixer (PC). Faders adjust levels for each installed speaker with a high degree of control. "Solo" sends sound to selected speaker only, muting the others. This is useful to ensure that left and right are not reversed, for example.

Surround Sound (Macintosh). Controls all surround functions, including Sensaura (PC), TruSurround XT, Circle Surround II, Dialog Enhancement, and TruBass. Refer to the following "Listening Tests" section of this guide for detailed information and suggested evaluation procedures.



Speaker Setup (Windows). Provides identical functionality to the Macintosh version. "Bass Management" option routes full-range signal to speakers if they are large enough to handle bass frequencies. If small speakers are specified, bass signals are automatically routed to subwoofer.

Operating System Considerations

- Operating systems for the PC and Macintosh differ in their support of multichannel audio, a fact of life that affects all third-party developers. The following sections provide information on which tests are supported under which operating systems.

Listening Tests

With the Revolution 7.1, the proof is in the listening. Ideally, you would have two computers that are identical in every way except for the sound card installed. This will allow you to make direct A-B comparisons with Revolution 7.1 and the competing sound card of your choice. If not, you'll use one system and swap the sound cards in and out as necessary.

Note that some competing sound card driver software assumes single card functionality and this software can conflict with other sound cards. We've noticed that even after a full uninstall of some competitors' drivers and software, some residual software is left on the system which can still cause problems if a new sound card is later added to the system. We recommend installing the Revolution 7.1 on a clean, updated system.

**GAMES WITH
EAX 1.0, EAX
2.0, DIRECT-
SOUND3D,
A3D AND
OTHERS
SOUND
AMAZINGLY
REAL WITH A
THE REVOLU-
TION 7.1
CARD**

Test 1: Inherent Noise

This test compares the inherent noise—or lack of noise—present in the sound cards. The Revolution 7.1 features a professional 107 dB signal-to-noise ratio.



DO NOT PLAY AUDIO CONTENT DURING THIS TEST.
Doing so may damage speakers and cause hearing loss.

1. Connect the competing sound card/computer combination to powered speakers or a stereo receiver, then turn the volume up all the way. Listen for the amount of noise present.
2. Turn the volume all the way down, then connect the speakers to the Revolution 7.1.
3. Repeat the same test with the Revolution 7.1. You should hear no noise from the Revolution 7.1.

You may hear noise associated directly with the powered speakers, cables, stereo system, or amplification, but not from the Revolution 7.1. It helps to test with a higher-quality sound system that doesn't introduce a lot of noise. Note that it is also important to listen for noise during quiet parts in music. Some competing cards utilize "muting circuitry," which eliminates noise by muting when no sound is playing back. Unfortunately, these turn off when sound is playing, so noise is again introduced into the audio signal.

Test 2: Surround Gaming

Here's where you surround yourself with the Revolution 7.1's 3D positioning using Sensaura technology. Games enabled with EAX 1.0, EAX 2.0, DirectSound3D, DirectSound, I3DL2, and A3D offer amazing realism when played through the Revolution 7.1.

1. Choose a game that supports positional audio, such as Unreal Tournament 2003, Jedi Knight II: Jedi Outcast, or Warcraft III.

2. Open the Revolution control panel software, and select the “Sensaura/Game Mode” option in the “Surround Sound” pane.
3. Launch the game and choose a positional audio setting in the game’s audio settings such as DirectSound or EAX 2.
4. Play the game, listening to both the audio quality and the immersive surround effect the Revolution 7.1 provides.
5. On games with good use of positional audio, you gain a competitive advantage by being able to hear where danger or a target is coming from. You can test positional audio simply by playing, but you may want to try triggering sound in one direction (such as by throwing a grenade), turning your “character” around or to the side, and noting which speaker the sound effect comes from.

While neither Mac OS 9 nor X have an established API for positional or 3D gaming audio, there are some games for the Mac that can provide positional audio by using Circle Surround II’s Cinema Mode. Starcraft supports Dolby Surround and will provide positional audio with CSII enabled on Revolution. Games that use the Miles positional sound system are also supposed to be Dolby compatible and can provide positional audio on the Mac when Circle Surround II’s Cinema Mode is enabled. Warcraft III from Blizzard is a good example of this. Note that the combined system requirements of game processing and Circle Surround II decode may be somewhat high.

Test 3: Stereo Music

This test demonstrates the Revolution 7.1’s superior sound quality when playing a stereo CD, MP3, or Internet radio.

1. Audition one or more CDs, MP3s, and/or Internet radio selections using the competing sound card.
2. Switch to the Revolution 7.1 and access the control panel software.
3. Enable the “Stereo” or “Stereo w/Integrated Subwoofer” speaker sets if you have a stereo speaker set or a “2.1” set with a stereo speaker and crossover that sends bass to the built-in subwoofer. If you have a true 2.1 set that has a discrete subwoofer input channel, choose the “Stereo w/Discrete Subwoofer” set and enable Bass Management.
4. Audition the same music as before.

Note the superior audio quality of the Revolution 7.1. You should notice the improved dynamic range, lower noise, and increased clarity of the audio. On sources that are inherently very compressed or low fidelity—such as Internet radio—you may have a more difficult time telling the difference in sound quality. You may want to use one of the CD tracks listed in the “Music Listening Samples” section.

Test 4: Surround Sound on Stereo Speakers

These tests demonstrate virtual surround sound through stereo speakers using SRS TruSurround XT. It's perfect for users who have only two speakers or headphones connected to their system. The software can create an enhanced sound mix from either an original 5.1 surround soundtrack or from the stereo mix placed on many DVDs, as well as CDs or MP3s.

1. Open the Revolution 7.1 Control Panel. In the Surround Sound tab, turn on TruSurround XT and set it to "Cinema" mode.
2. Audition an action scene on a DVD that offers a good dynamic range and use of surround channels. For best results, use the included WinDVD 4 software (PC) so that surround information can be pulled from the decoded Dolby Digital soundtrack and virtualized with TruSurround XT on stereo speakers. On the Macintosh, this can be performed using Apple's DVD Player.
3. Test Revolution's ability to enhance dialog. Turn "SRS Dialog Clarity" on and audition a DVD passage featuring dialog along with music or sound effects. Experiment with the Dialog Enhancement Level control, as well as toggling Dialog Enhancement on and off. You should notice a marked improvement in the clarity of the dialog. Try enhancing bass using the TruBass slider.
4. Switch to a competing card or built-in audio and watch the same scene in basic stereo mode.
5. Switch to the Revolution 7.1, and access the control panel. Turn off TruSurround XT.
6. Open a Media player, such as Windows Media Player or iTunes. Audition a song, such as one of the tracks recommended in the Appendix.
7. Open the Revolution 7.1 Control Panel. Turn on TruSurround XT and switch to "Music" mode. Play the same song and listen for the increased sense of "dimension" that TruSurround is able to provide.
8. Try enhancing dialog or vocals using the Dialog Clarity slider and enhancing bass using the TruBass slider.

You should notice a significant improvement with the Revolution 7.1 audio card. With TruSurround engaged, notice the aural impression of surround sound even though there are only two speakers. When you switch the output back to the competing audio card, you'll certainly notice a marked contrast.

Since the SRS software boosts key frequencies, it may compensate by easing the overall volume setting. To maintain comparable volume levels, you may find it useful to boost overall volume when TruSurround features are enabled.

**TRUBASS
 CONVERTS
 THE RUMBLE
 OF MISSILE
 LAUNCHES
 AND EXPLO-
 SIONS INTO
 FREQUENCIES
 THAT HOME
 SPEAKERS
 CAN HANDLE**

POWERED
SPEAKERS
THAT CAN'T
DECODE
DOLBY
DIGITAL OR
DOLBY
DIGITAL EX
ARE NOT LEFT
OUT: REVOLU-
TION 7.1
AND THE IN-
CLUDED
WINDVD 4.0
ARE ALL YOU
NEED

Test 5: DVD Surround Decode

This test shows the Revolution 7.1's ability to decode Dolby Digital and Dolby Digital EX encoded surround sound using the included WinDVD 4 DVD player. This illustrates how the Revolution 7.1 can be used with any surround speakers or receiver, even if they do not have a built-in decoder. It also highlights the excellent audio quality of Revolution's digital to analog performance. (This test works with Windows Me/2000/XP. Mac OS 9 and X do not support this feature)

1. Connect the Revolution 7.1 to a surround-sound receiver or multimedia speakers via the 1/8" analog connections. Select your speaker configuration from the Revolution 7.1 control panel. Make sure "SRS Circle Surround II" is not turned on.
2. Launch the WinDVD 4 Dolby Digital EX version included on the Revolution 7.1 Applications CD. The first time you use the application, you may need to go into the program's "Setup" screen and change the "Audio Speaker Configuration" to match the number of speakers you have connected.
3. Audition a DVD with a wide dynamic range and good use of surround sound audio, such as an action scene. The Revolution 7.1 delivers the full 7.1 surround sound experience.
4. Switch to the competing sound card. You should notice a marked contrast between the Revolution 7.1 and the other audio hardware.

Test 6: DVD Surround Sound Pass-Through

This test shows the Revolution 7.1's ability to play back Dolby Digital and/or DTS surround-sound signals to a surround decoder. (These tests work with Windows Me/2000/XP. Dolby Digital output works with the VideoLan Client DVD Player in Mac OS X. Mac OS 9 does not support Dolby or DTS output.

1. Connect the Revolution 7.1 to a surround-sound decoder using the S/PDIF coaxial digital connector. Select the "Digital Output" speaker set in the Revolution Control Panel. On the Mac, you may also need to go to the "Sound" Control Panel or Preference Pane and choose the "Revolution Digital Out" driver.
2. Launch your DVD player and enable digital or S/PDIF output from the player's preferences or audio output options. Audition a DVD with a large dynamic range and good surround sound support, such as one of the suggested scenes in this document. The Revolution 7.1 delivers the full surround sound experience. Your decoder should note that it is receiving a Dolby Digital or even DTS (PC only) stream,

Test 7: Circle Surround II Decode

This test shows the Revolution 7.1's ability to decode Dolby Pro Logic, Pro Logic II, or SRS Circle Surround II encoded material using SRS Circle Surround

II technology (These tests work with Windows Me/2000/XP, and both Mac OS 9 and X.)

1. Connect the Revolution 7.1 to a surround-sound receiver or powered speakers using the analog audio outputs. Choose the speaker set in the Revolution Control Panel that most closely matches your speaker setup. Depending on your operating system, you may also need to go to the "Sound" or "Sound and Multimedia" Control Panel and choose the "Revolution Analog 7.1 Out" driver if you have previously changed output to digital.
2. In the Surround Sound section of the Revolution Control Panel, turn on Circle Surround II and enable "Cinema" Mode.
3. Launch any two-channel DVD player application and audition a DVD with good surround sound mixing, such as one of the scenes suggested in the appendix.
5. Switch to a competing sound card. You should notice a marked contrast between the Revolution 7.1 and the other audio hardware's ability to expand a stereo signal into surround sound.
6. Switch back to the Revolution 7.1. After listening to Circle Surround II processed audio for a while, open the Revolution 7.1 control panel and turn off "SRS Circle Surround II." Note the added depth that this mode provides. Some volume overhead is necessary for Circle Surround processing; you may need to increase the volume slightly with Circle Surround enabled.
7. Turn "SRS TruBass" and "SRS Dialog Clarity" on. Experiment with various levels, as well as toggling TruBass or Dialog Clarity on and off. You should notice a marked difference in bass response and dialog sharpness.

SRS CIRCLE-SURROUND II ENABLES SURROUND SOUND FROM ANY DVD OR MEDIA PLAYER, INCLUDING THE APPLE DVD PLAYER

Test 8: Playing Music In Surround Sound

These tests demonstrate the Revolution 7.1's ability to play music in true surround sound (using Circle Surround II), and the ability to play multichannel Windows Media Audio 9 Professional (WMA Pro 9) audio files. (The Circle Surround test works with Windows Me/2000/XP, and both Mac OS 9 and X. Windows Media 9 does not yet have Macintosh support).

1. Open the Revolution Control Panel and make sure Circle Surround II is off in the "Surround Sound" pane.
2. Audition a stereo WMA or MP3 music file, such as one of the following: www.microsoft.com/windows/windowsmedia/democenter/9series/avquality/wmapromp3/default.htm
3. From the same site, audition a multichannel WMA 9 Pro file.

Note the far more "immersive," or enveloping feeling of the 5.1 or 7.1 WMA 9 Pro mix. You can hear instruments surrounding you and a multichannel experience that matches what the artist wanted you to hear.

4. Audition a song from a CD or high-quality stereo WMA or MP3 file using a media player such as iTunes or Windows Media Player.
5. Open the Revolution Control Panel and turn on Circle Surround II's "Music" mode in the "Surround Sound" pane.
6. Listen to the same song again. While any music will benefit from Circle Surround II's enhancement, music recorded with better channel separation provides a better surround experience. Try the "Recommended for CSII" tracks listed in the "Music Listening Samples" section.
7. Switch to the Revolution Control Panel's Output Mixer and note the meters representing additional surround channels. If you don't see additional channels in the mixer, the source music may be mono and require you to set Circle Surround II to the "Mono" setting. Many Internet Radio broadcasts are mono.

Note the immersive surround mix. On live albums, you can hear crowd noise in the rear speakers, instrument and vocal separation, and great sense of "being there." The beauty of this feature is that it works with your entire CD, MP3, and WMA collection.

8. Hook up an external MP3 player, DAT, MiniDisc, XM Radio, Satellite Receiver, or other external music/audio source to Revolution's "Line In" jack.
9. Open the Revolution 7.1 Control Panel and with Circle Surround still enabled, check the "Enable Monitoring" or "Monitor Input on Output" checkbox in the Surround Sound pane. Leave the Control Panel open or minimize it without quitting or closing the Control Panel.
10. For stereo music, you should leave CSII in "Music" mode. For audio that is Dolby Pro Logic or Circle Surround II encoded—such as many TV broadcasts—set CSII to "Cinema" mode.

You can perform real-time stereo-to-surround sound conversion of any external audio source and breathe new life into audio coming from your satellite TV receiver, digital or satellite radio, hard disk MP3 player, or other source. Now any audio source can be played back in surround up to 7.1, thanks to the Revolution 7.1 and Circle Surround II. This is an extremely useful and powerful feature in a home theater environment.

Test 9: Laboratory Audio Testing

Listening is the true test of any sound card. Yet for the engineers among us, some prefer to see objective "laboratory tests" that corroborate what the ear hears. This document's technical and audio performance specifications (see charts on pages 8 and 25) list some of the card's audio performance specifications with competing cards. The results speak for themselves.

Audio testing with standard equipment (such as Audio Precision), especially at higher audio qualities—such as 24-bit/96kHz and 24-bit/192kHz—confirms the

Revolution 7.1's sound quality. Revolution's sound quality results do not rely on brick wall filters during testing, or muting circuitry to reduce noise when no audio is playing, or on any other "smoke and mirrors" tricks that manufacturers may use to inflate their audio quality measurements. Some items to consider as you test:

- The Revolution offers superb line-input quality, but its line-out quality is even better. Test methods that perform loopback tests (from output to input), such as the Rightmark Audio Analyzer program, underestimate the quality of Revolution's audio output.
- Use high-quality test cables. Poor quality or poorly-shielded cables can degrade audio test results. Use a short 1/8" to 1/8" cable with good shielding for a loopback test.
- Watch for cable interference: Make sure to isolate the test cable from noise sources commonly found behind a computer. Cable modems, power strips, power supplies, AC cable—all of these emit noise and can degrade signal quality on an audio cable, especially if it's poorly shielded.
- Do not plug anything into the Mic jack while testing line input or performing a loopback testing using the line input. The Mic and Line In jacks are summed together and, while the Mic input provides high-quality audio input, it is not as high quality as the Line in or Line outputs. Performing a loopback test with a cable plugged into the Mic in jack (even if testing the Line in) will degrade test results.
- Use a good power supply. A poor quality power supply can leak 60Hz noise into the board power. You can see this noise and its harmonics on a noise plot as 60Hz, 180Hz, and 300Hz spikes. This will seriously degrade audio quality scores and adds about 30dB to noise level. Of course, with 220V power, these spikes are at 50, 150, and 250Hz. This can be fixed by using a good power supply (such as Antec TruPower, etc.).
- Watch for crosstalk noise. This is where noise is coupled in to Revo from a noisy network card, video card, etc. There are no real indicators—such as spikes—that this is happening; you will just get poor quality test scores. This can be generally be fixed by moving the Revolution card to a different slot, farther away from other cards.
- When using RightMark Audio Analyzer, make sure to follow the steps below for proper setup/configuration. Improper setup of RightMark can easily provide erroneous test results.

M-Audio can provide you with additional detailed Audio Precision test results. If you're interested in this information—more than 110 pages of very technical results—feel free to contact us (see the contacts list on page 3). Our testing, as well as results from partners and press, objectively support that the Revolution 7.1 is the best sounding consumer audio card available today. We've also seen a number of user RMAA Revolution tests on the web that support this. If your test results don't agree, please contact us. We'll be happy to discuss your test configuration.

RightMark Audio Analyzer Testing

Please see the section above for more notes on test configuration. We highly recommend using RMAA version 5.0 or later as it has more accurate test capabilities.

For RMAA 4.3:

1. Open RMAA and the Revolution control panel.
2. In the Revolution control panel's "Speaker Setup" tab, set current set to Stereo. Also, set the crossover to "off," turn off Bass Management, and set the output volumes to maximum.
3. On the "Output Mixer" tab, verify levels are at maximum (they should be if you configured output in Speaker Setup).
4. On the "Surround Sound" tab, switch to "No Processing."
5. In the "Input/Other" tab, set the input to minimum and disable monitoring. These are crucial.
6. Set the master volume (the speaker icon in the Windows system tray) to maximum. This is also crucial.
7. In the RMAA application, click "Adjust I/O levels" and check the levels. They should be around -0.8dB (*see explanation below).
8. In RMAA's "Soundcard Settings.." set the device to Revolution, and choose the sound quality you wish to test (24/96, for example).
9. Click "Run Tests." Your testing was accurate if you get around -101 dBA noise level.

For RMAA 5.0

1. Perform steps 1-7.
2. Select "Loopback Test"
3. Levels should be around -1.8dB
4. Set playback/ recording settings.
5. Press the loopback button in the lower left.
6. Scores should be higher than those found in RMAA 4.3, especially in dynamic range and crosstalk. Noise level should be better than -101 dBA.

**The Revolution card was designed so that at full scale output, you can loop-back to the input and not overdrive the ADC (about .5 dBu less than the ADC's maximum value).*



Additional Materials

Product Specifications

The following series of charts lists all technical specifications for the M-Audio Revolution 7.1 high-definition surround sound audio card. Specifications are subject to change without notice due to continuing product improvement programs.

Hardware Features	
Output	8 analog channel line outputs (through 4 stereo 1/8" Mini jacks) S/PDIF digital coaxial output (RCA) S/PDIF out can transmit either linear PCM or AC-3
Input	Stereo 1/8" Mini Analog Line Input Mono 1/8" Mini Analog Microphone Input with electret mic power

Driver Features	
Playback Formats	24-bit linear PCM 16-bit linear PCM Up to 24-bit AC-3 output over S/PDIF (not available in Mac OS 9) Up to 24-bit DTS output over S/PDIF (not available in Mac OS) SRS Circle Surround II processing PC & Macintosh SRS TruSurround XT processing PC & Macintosh Sensaura (for 3D gaming) (PC Only)

Product Specifications (cont'd.)

Audio Performance	
Line Outs	
Dynamic Range	106 dB (typical, -60 dB input, a-weighted)
Signal-to-Noise Ratio	107 dB (typical, a-weighted)
THD	0.003% (i.e., -90dB)
Max. Line Output Level	1.26 Vrms (+2 dBV)
Frequency Response	+0.8/-0.0 dB, 20 Hz to 20 kHz +0.8/-3.0 dB, 20 Hz to 80 kHz
Crosstalk	-120dB
Mic In	
Dynamic Range	90 dB (a-weighted)
Signal-to-Noise Ratio	90 dB (a-weighted)
THD	0.003% (i.e., -90dB)
Frequency Response	+0.0/-3.0, 80Hz to 17kHz
Line In	
Dynamic Range	105 dB (a-weighted)
Signal-to-Noise Ratio	100 dB (a-weighted)
THD+N	0.003% (i.e., -90 dB)
Maximum Input Level	1.45 Vrms (+3.2 dBV)
Sampling Frequencies (KHz)	
No sample rate conversion	32, 44.1, 48, 88.2, 96, 172.4, 192
With MME rate conversion	All sample rates up to 200kHz

Product Specifications (cont'd.)

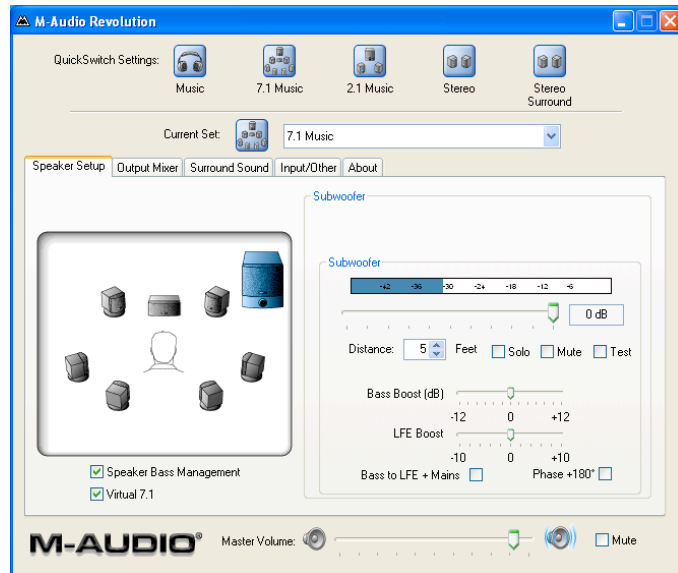
Minimum System Requirements	
With SRS Circle Surround II disabled	
PC	200MHz Pentium with MMX 64 MB RAM Windows Me, Windows 2000, or Windows XP
Macintosh	PCI-based PowerMac with built-in USB 64 MB RAM Mac OS 9.2.2 or OS X (10.1.5 for Dolby Digital pass-through)
With SRS Circle Surround 7.1 enabled	
PC	700 MHz Pentium III 128 MB RAM Windows Me, Windows 2000, or Windows XP
Macintosh	PowerMac G4 500 128 MB RAM Mac OS 9.2.2 or OS X (10.1.5 for Dolby Digital pass-through)

Bass Management

One of the least flashy, but most revolutionary features of the Revolution 7.1 is its advanced theater-grade bass management. First, we should discuss what bass management is and why it's important. Then we can talk about why Revolution's implementation is so advanced.

The most common home theater or surround sound speaker sets are made up of small speakers (satellites) that surround the listener. These speakers are generally not full-range, tower-type, speakers capable of reproducing everything from the lowest bass to the highest highs. The key to using type of speaker configuration is to route bass that would normally go to these satellite speakers to a subwoofer instead. This works because bass is perceived as "non-directional," meaning that you can place a subwoofer almost anywhere in the room and have it represent audio coming from any speaker. The simplest method of implementing bass management is to set a single crossover frequency for all your satellite speakers, below which all sound goes to the subwoofer.

Bass Management (PC). Simply select the subwoofer in the "Speaker Setup" pane. With the "Bass Management" checkbox enabled, you gain access to a number of powerful controls over your system's bass settings.



**REVOLUTION
FEATURES THE
MOST POWER-
FUL BASS
MANAGEMENT
OF ANY SOUND
CARD—IT IS
MORE POWER-
FUL THAN
MOST HIGH-
END SUR-
ROUND RE-
CEIVERS**

The power of Revolution's bass management technology is that it provides more control over bass than most high-end surround sound receivers. It is possible to set the crossover at "none" for your full-range front left/right speakers, a 40Hz crossover for the surround left/right, a 60Hz crossover for the center, and 80Hz for the surround center left/right. Even with a complex speaker setup like this, Revolution is able to accurately route bass where needed. Also key is the discrete handling and control of both types of bass: LFE (Low Frequency Effects, or the dedicated bass audio channel on a DVD), and Bass (all of the redirected bass that would have gone to the satellites). This is important since it allows a level of fine-tuning for audio that home theater enthusiasts have been clamoring for. Revolution's bass management makes the subwoofer channel work in a 5.1 system used for music, can extend the life of your speakers by not routing audio to your satellites that they are not capable of handling, and improves the sound quality of your speaker system by playing the right audio through the right speaker.

Note: M-Audio is in the process of providing additional enhancements to the Revolution 7.1 bass management software. Depending on when you review the product, the software you download from our website will use one of two methods. Both are accurate and powerful, but you may want to understand in more detail how bass is handled in each:

- 1 The current bass management reduces overall volume by 6dB to ensure accurate levels and to keep from overloading the subwoofer with the additional bass coming from other speakers. If you notice a slight volume drop when bass management is enabled, this is the method being used. When using this bass management, you can slightly increase the main volume level to adjust for this.
- 2 Soon the software will only have a 6dB drop in the subwoofer channel when bass management is enabled, to protect against overloading the subwoofer channel with redirected bass. You can adjust the "Bass Boost" and LFE Boost" sliders to "0" to

maintain the flattest level balance, but you should optimize all of your output levels to reduce the chance of overloading your speaker system. If you notice no volume drop when bass management is enabled, or only a slight volume drop on the sub-woofer, this is the bass management scheme used in your Revolution 7.1 driver version.

7.1 Surround Sound Receivers

Though 7.1 technology is new to PC audio, it is already well-established in the home theater market. The sampling below lists just a fraction of the 7.1 surround receivers available today. There are numerous manufacturers, not listed below, who also offer 7.1 receivers or processors including Krell, Yamaha, Lexicon, Rotel, Meridian, Outlaw, Integra, NAD, and Myryad.

Receivers with 7.1 Support	
Manufacturer	Model
B&K	AVR-307
Denon	AVR-3803
Denon	AVR-4800
Harman Kardon	AVR320
Harman Kardon	AVR325
Harman Kardon	AVR520
Harman Kardon	AVR525
Harman Kardon	AVR7200
Harman Kardon	AVR8000
Harman Kardon	AVR8500
Harman Kardon	DPR1001
JVC	RX-DP10VBK
JVC	RX-DP9V BK A/V
Marantz	SR9200
Onkyo	TX-DS898
Onkyo	TX-DS989
Onkyo	TX-DS989ver2
Onkyo	TX-NR900
Onkyo	TX-SR800
Pioneer	VSX-AX10i
Pioneer	VSX-D1011
Pioneer	VSX-D2011
Sony	STR-DA4ES
Sony	STR-DA7ES
Source: M-Audio	
Representative list only. Subject to change.	

DVD Test Scenes

The following chart identifies scenes that are great for auditioning surround sound. The DVD chapters below highlight one or more significant parts of the surround audio experience or another: bass, directional audio, environmental audio, audio clarity, dynamic range, etc. Titles designated “6.1” are specifically designed for playback on a 7.1 surround speaker configuration (see 6.1 vs. 7.1 on page 15 for more information). Note that the chapter numbers in the chart locate start scenes for particularly good sections. While some may be short, others may be as long as a few chapters.

Note also that most DVDs contain multiple audio tracks. For the best experience, choose the Dolby Digital or Dolby Digital EX tracks rather than the Dolby Stereo track when using the included version of WinDVD for PC, or the VLC Player for Mac. If you have a DTS-decoding DVD player or decoder, try the DTS track available on many of these titles. While most disks default to the correct setting, it is worth checking this to avoid auditioning a stereo audio track accidentally.

Suggested DVD Viewing					
DVD Title	Scene	Chapter	Comments	Support*	Channels
Star Wars: Episode 2	Jango Fett Fight	26	Great bass. Good Music. Great directional Audio.	DD EX	6.1
Lord of the Rings: The Fellowship of the Ring	Opening scene, Cave Troll, Others	1/29	Great ambient audio and bass. Great dynamic range and fidelity. The entire film makes almost constant use of surround channels. Oscar nominated for best sound and music.	DD EX	6.1
Fifth Element: Superbit Edition	ZF1	13	Great directional Audio-Great Bass.	DD	5.1
Star Wars: Episode 1	Pod Racer	22	Excellent directional Audio in 6.1. Great Bass.	DD EX	6.1
Fifth Element: Superbit Edition	Taxi Chase	9	Good directional Audio-Great Bass. Great Music.	DD	5.1
Star Wars: Episode 2	Chase Scene	7	Great bass. Good Music. Good directional Audio.	DD EX	6.1
Dolby's "Explore our World"	Rain	19	Nice highs and bass. Great channel separation.	DD	5.1
The Matrix	Lobby	29	Good bass & surrounds. Little directional audio	DD	5.1

Suggested DVD Viewing					
DVD Title	Scene	Chapter	Comments	Support*	Channels
			(environmental only)		
U571	Depth Charge	15	Room shaking explosions and bass. Great environmental audio.	DD	5.1
IMAX Super Speedway	Michael Andretti Test Drive	21/22	Great directional and positional audio- Great visuals.	DD 5.1	5.1
Toy Story 2: Toybox Edition	Opening 5 Minutes	1	Great audio. Great Bass. Little directional.	DD EX	6.1
Toy Story 2	Balls bouncing in toy store	21	Great audio. Great Bass. Great directional.	DD EX	6.1
The Fast and the Furious	NOS Fest	4	Use of music in surrounds is unique.	DD	5.1
Terminator Two: Ultimate DVD Edition	Chase	18	Light, but effective use of surrounds.	DD EX	6.1
The Matrix	Dodge This	30	Great directional audio.	DD	5.1
Pearl Harbor	Battle of Britain Attack on Pearl	11 22	Great directional audio and room shaking bass.	DD	5.1
Ice Age	Opening	1	Great LFE effects. Subtle, but effective positional audio.	DD	5.1
Moulin Rouge	Sparkling Sad Diamonds	6 30	Great ambient audio and music. Oscar nominated for best sound.	DD	5.1
Source: M-Audio				*DD = Dolby Digital	

Music Listening Samples

The recordings listed in the following chart are great for auditioning sound quality and stereo-to-surround conversion. Items checked “CSII” are excellent for Circle Surround II playback. Music with a “hard center” recording style may not provide much surround separation when used with Circle Surround II; recordings with good stereo separation provide a better multichannel experience.

Suggested CD Listening				
Artist	Album	Track	Notes	CSII
Dave Matthews Band	Listener Supported (Disk 2)	Granny, Two Step	Try with Circle Surround II on and off. Note crowd noise broken out into rear speakers and good channel separation. Great live feel.	✓
The Eagles	Hell Freezes Over	Hotel California	Try before and after with Circle Surround II. Note crowd noise broken out into rear speakers and good channel separation. Great live feel.	✓
Tracy Chapman	Tracy Chapman	Fast Car	Clean guitar and tight bass.	
Diana Krall	Love Scenes	All or Nothing at All	Very clean recording. Good bass and vocals. Quiet spots for noise checks.	
Sting	Ten Summoners' Tales	Fields of Gold	Clean recording. Clear vocals, rim shots, and guitar. Less separation in Circle Surround II, but wonderful in Stereo.	
Sting	Nothing Like the Sun	Englishman in New York	Smooth recording. Clear vocals, high hat, and guitar. Less separation in Circle Surround II, but wonderful in Stereo.	✓
Jewel	Spirit	Standing Still	Try with Circle Surround II.	✓
Pink Floyd	Pulse (Live)	Money	Try with Circle Surround II.	✓
Queen	Bohemian Rhapsody	Bohemian Rhapsody	Try with Circle Surround II.	✓
Enya	A Day Without Rain	Only Time	Try with Circle Surround II.	✓
Enya	Soundtrack to Fellowship of the Rings	May it Be	Starts with nice vocals and great bass. Nice ambient feeling with CSII enabled. This recording contains clicks near middle of song that sound like vinyl pops.	✓
John Mayer	Room for Squares	Your Body is a Wonderland	Nice bass. Clean recording.	✓
Source: M-Audio				

Additional Resources

Both Dolby Laboratories and Digital Theater Systems (DTS) are an excellent source of technical information regarding surround sound. You may find the following links useful.

Dolby Explains 5.1 vs. 6.1 vs. 7.1:

dolby.custhelp.com/cgi-bin/dolby.cfg/php/enduser/std_adp.php?p_sid=RSAeb1Dg&p_lva=&p_faqid=135&p_created=1013441850&p_sp=cF9ncmlkc29ydD0mcF9yb3dfY250PTcxJnBfcGFnZT0x&p_li

Previous and Upcoming Dolby Digital and Dolby Digital Surround EX films:

www.dolby.com/movies/films_previous.html
www.dolby.com/movies/films_upcoming.html

DTS ES Explained:

www.dtsonline.com/dts-es2.pdf

DTS ES and DTS ES Discrete Titles (since January 2003):

www.dtsonline.com/home/dvdvideo.pdf

Company Backgrounder

M-Audio, Inc (formerly Midiman Inc.) was founded in 1988 with the goal of offering complete audio solutions to meet the needs of recording artists, audio professionals, and consumers. To achieve this goal, the company leverages cutting-edge, high-quality technology, offering features and pricing that are accessible to musicians, audio professionals, and consumers. That strategy is on track: Sales in January 2002 grew 109 percent compared with the same period one year earlier.

In December 2001, M-Audio launched its consumer division, bringing pro-quality audio products to the consumer. The consumer division was established to leverage M-Audio's professional audio technology in order to make the highest-quality consumer audio products, and to establish M-Audio as the premier and preferred supplier of innovative audio products to the consumer.

While much of M-Audio's early growth resulted from the development and sales of its computer sound cards, it is the integration of software and hardware that has powered M-Audio's transition from an audio and MIDI (Musical Instrument Digital Interface) products company to a provider of complete solutions with significant influence in the industry.

M-Audio has created several programs to support new and emerging artists. The M-Powered Artists program sponsors both known and unknown artists, providing wider recognition for their musical contributions. M-Audio also created MORE, (M-Audio Outreach Recording Ensemble), a program designed to teach music and music technology to abused and underprivileged young people.

In addition to its U.S. headquarters, M-Audio maintains ongoing operations in Canada, the United Kingdom, Germany, France, and Japan.

M-AUDIO®

Press Release

M-AUDIO LAUNCHES INDUSTRY'S FIRST HIGH-DEFINITION 7.1 SURROUND SOUND CARD

**Revolution 7.1 delivers up to eight channels of pristine quality,
24-bit/192kHz audio for immersive music, movies and games.**

Arcadia, Calif., December 9, 2002—M-Audio today announced Revolution 7.1, the first high-definition 7.1 surround sound card providing up to eight channels of professional 24/192kHz audio with consumer-oriented features. Revolution 7.1 allows PC and Mac owners to play DVDs and all their music in surround sound, experience more realistic gaming, and record or mix their own music.

With output for up to seven speakers and a subwoofer, the Revolution 7.1 rivals even the best movie theaters. Where 5.1 places speakers beside the listener, 7.1 places them both beside and behind them for a much more immersive and believable surround sound experience. Revolution 7.1 even lets users experience eight channels of high-definition 24-bit/192kHz audio simultaneously. The included Dolby Digital EX DVD player allows listeners to immerse themselves in today's highest quality DVD surround sound. Revolution 7.1 fully supports stereo, 4.1, 5.1, and 6.1 formats as well.

Full support for Microsoft Windows Media Audio 9 Professional delivers high-quality, discrete multi-channel audio over the Internet today. With Windows Media Audio 9 Professional and the Revolution 7.1, PC users can enjoy incredibly high-quality, high-resolution surround sound streamed live or on demand from the Internet. Revolution 7.1's support for surround sound up to 7.1 and for high-definition audio playback make it a great way to experience high-quality Windows Media Audio 9 Professional content at lower data rates than other formats. Whether playing back video files in surround sound, or today's latest music released in stereo or surround Windows Media 9 format, Revolution provides you with the most realistic and immersive audio available.

Built-in SRS Labs' Circle Surround II™ technology instantly transforms CDs, MP3, and other content into incredibly lifelike surround sound, dynamically separating instruments, vocals, and even crowd noises for a dramatically enhanced listening experience. "Revolution is the first consumer audio card to offer the same high-quality Circle Surround II technology found in many home theater receivers around the world," said Ted Franceschi, Executive Vice President, Marketing and Sales. "SRS Labs is excited to partner with M-Audio in providing PC and Macintosh users the ultimate surround sound experience on a computer." Those without a 5.1 or 7.1 speaker system can still enjoy stunning results from Revolution 7.1, thanks to built-in SRS TruSurround XT™ technology. This powerful virtual surround sound process delivers the multi-channel audio experience over standard stereo speakers or even headphones. TruSurround XT enables two channel listening

that brings home what the filmmakers intended to be heard, even if additional speakers are not present.

Revolution 7.1 is also designed with gamers in mind. Ultra-realistic 3D positional audio makes players feel like they're really in the game while providing the extra advantage of hearing exactly where danger lies. Revolution 7.1 supports today's popular game technologies such as Sensaura, EAX, DirectSound3D, and A3D.

M-Audio has distilled years of experience making audio solutions for recording professionals into this powerful, easy-to-use, PCI surround sound solution for the consumer market. Specs such as a high 107dB signal-to-noise (SNR) ratio and exceptionally low distortion (THD) rating of 0.0031% insure that sound is clear and clean—from whisper quiet music to room-rattling explosions. Revolution 7.1's intuitive control panel also makes it easy to access powerful pro features like Bass Management, Speaker Optimization and Input Metering.

“Revolution 7.1 earns its name as a truly revolutionary product by simultaneously delivering fully immersive 7.1 surround sound and amazing high-definition 24-bit/192kHz audio,” says Jason Ivan, Director of Product Marketing for M-Audio's Consumer Division. “And where most cards sacrifice audio quality for surround sound playback, Revolution delivers all eight channels at full 192kHz fidelity. Listeners can finally enjoy movies, music and games the way they were meant to be experienced. Revolution 7.1 delivers serious audio performance and quality with ease of use designed to appeal to a wide segment of the consumer market.”

Revolution includes over \$200 of high-quality bundled software with full versions of Tony Hawk's Pro Skater 3, MixMan Studio, VJ Lite, and the Dolby Digital EX version of WinDVD 4. Also included are award-winning music creation programs with over 100 sounds and loops as well as a free sampler CD of music from M-Powered artists who use M-Audio products.

Revolution 7.1 is scheduled to ship in January 2003, and will be distributed in major retail stores throughout North America. It will be released soon after that in Japan and Europe. Estimated street price for Revolution 7.1 is \$99.99.

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